

Lockout/Tagout Safety

Hazard Alert



Dozens of construction workers are killed and more are injured every year because they did not de-energize and lock out equipment before working on it. Most of the deaths are electrocutions, but workers sometimes are crushed or have amputations or other injuries. These types of energy need to be controlled: electric, hydraulic, pneumatic, mechanical, heat, and pressurized liquids, vapors, and gases.

Protect Yourself

Lockout/tagout is a way to make sure electricity or other energy is not turned on (or released) while someone is working on machinery. **Turning off a power switch is not enough.** You must **de-energize** (prevent equipment from starting or moving), **lock it out**, release stored energy (for instance, bleed air from a pneumatic hose), and **test to make sure the energy is off.**

Your employer should:

- Set up a written lockout/tagout program
- Train you to use the program.*

The program should cover:

- Planning to identify:
 - energy sources
 - workers who can get hurt
 - who will de-energize equipment (and how).
- Keeping track of all involved workers
- Telling workers on new shifts about the lockout/tagout job
- Making sure the equipment is de-energized so it cannot be restarted
- Setting and removing lockout/tagout devices
- Coordinating with other jobs under way
- Releasing stored energy (for instance, discharging capacitors)
- Returning equipment to service (including testing or positioning of equipment).

Lockout/Tagout Procedure

1. **Notification.** Tell equipment operators and supervisors that power is being disconnected or isolated.
2. **Preparation.** Check with your supervisor for a written procedure (or checklist) that tells how to shut down and restart the equipment you are working on.
3. **Shutdown.** Turn off the equipment.
4. **Isolation.** Separate all energy sources using proper isolating devices – like manual circuit breakers or disconnect switches. Pushbuttons or selector switches cannot be the only way to de-energize. A lot of equipment has more than one type of energy that needs to be isolated.
5. **Lockout/tagout application.** Every worker who can be exposed to hazardous energy must be part of the lockout/tagout process.

*OSHA has a comprehensive standard for lockout/tagout for general industry (29CFR1910.147), but not for construction.

- A **lockout device** is a key or combination lock with a special tag with a worker's name. The lock must be attached to an isolating device, circuit breaker, and/or switch to prevent turning on the energy source or equipment or releasing energy.
- A **tagout device** is a tag and a way to attach it that can withstand at least 50 pounds of force. (Some tagout devices are attached with wire.) Use a tagout device only when you cannot lock out. The tag should have a label or sign that says no one can turn on the equipment or remove the energy-isolating device without permission. (OSHA allows tagout devices, but the National Institute for Occupational Safety and Health, NIOSH, does not recommend tagout-only work.)
- Each worker at risk should apply an individual lockout/tagout device to each source of hazardous energy – so there may be many locks or tags on each device. You must be the only one who has the key or combination for a lockout device you install – except in complex lockout/tagout (read below).

Individual qualified employee control. For minor servicing, maintenance, or inspection of plug-and-cord equipment, you may work without attaching lockout/tagout devices if you unplug the equipment and you always work next to the power plug and control the plug.

Complex lockout/tagout. A special written plan is needed when a job has more than one of any of these:

- Energy source
- Crew
- Craft
- Location
- Employer
- Way to isolate energy, or
- Work shift.

One crew member should be in charge of the whole lockout/tagout. This person should be trained and identified by name in the written plan. Each worker still should check to be sure all energy sources are locked out before starting work.

6. **Control of stored energy.** Release energy by discharging capacitors, removing jacks or chock blocks, or draining hydraulic lines, for instance.

7. **Verification.** Use testing equipment (such as an electric circuit tester) to make sure equipment has been de-energized.

8. **Removal of lockout/tagout devices.** Only the worker who puts on a lockout or tagout device should take it off. If someone else must take off the device, he/she must be sure that the person who installed it is not on the site, and must warn that employee when he/she returns.

9. **Return to service.** When the work is done and lockout/tagout devices are off, you must **test** and **look** to be sure all tools, mechanical restraints, and electrical devices have been removed before you turn on power. Before you re-energize, you must warn all workers who can operate the equipment and make sure no one else is near it.

10. **Temporary release.** If the job requiring lockout/tagout is interrupted for testing or positioning equipment, the procedures must start all over.

For more information, call your local union, the Center to Protect Workers' Rights (CPWR) (301-578-8500 or www.cpwr.com), NIOSH (1-800-35-NIOSH or www.cdc.gov/niosh), or OSHA (1-800-321-OSHA or www.osha.gov) or go to www.elcosh.org.

Health. The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH or NIEHS.